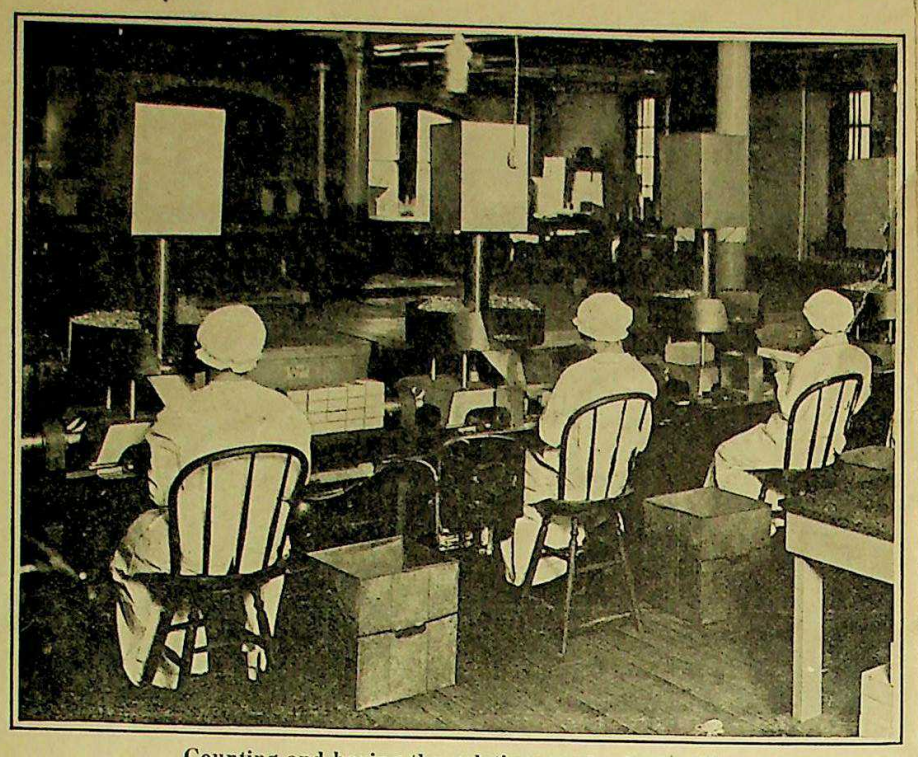
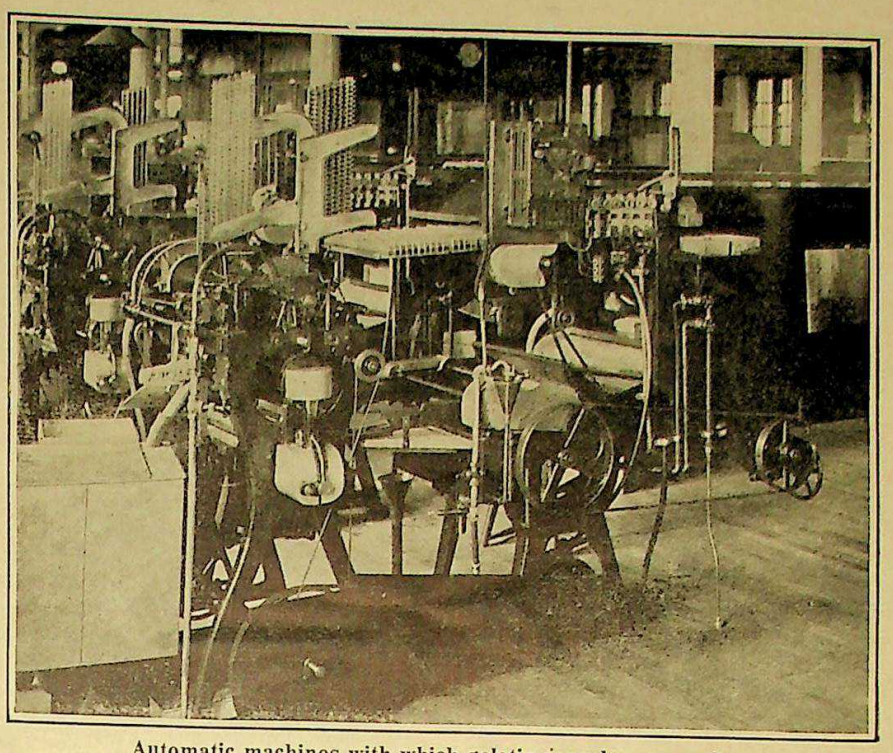


Counting and boxing the gelatin capsules by machine



Automatic machines with which gelatin capsules are made

Glue Jackets for Disagreeable Medicines

How Gelatin Capsules Are Manufactured

By Harmon W. Marsh

FORTUNATELY for our comfort, the days when grandfather shoved his dose of quinine as far back in his throat as he could, on the handle of a spoon, and washed it down with a drink of water, are relegated to the past. We now take our disagreeable powders in capsules, and the making of these has developed into an industry of considerable proportions.

Dry capsules are made from a very refined gelatin, which is so expensive as to be prohibitive for cooking purposes. The supply was formerly obtained in France, but a grade is now made in Michigan that is superior to that produced elsewhere in the world.

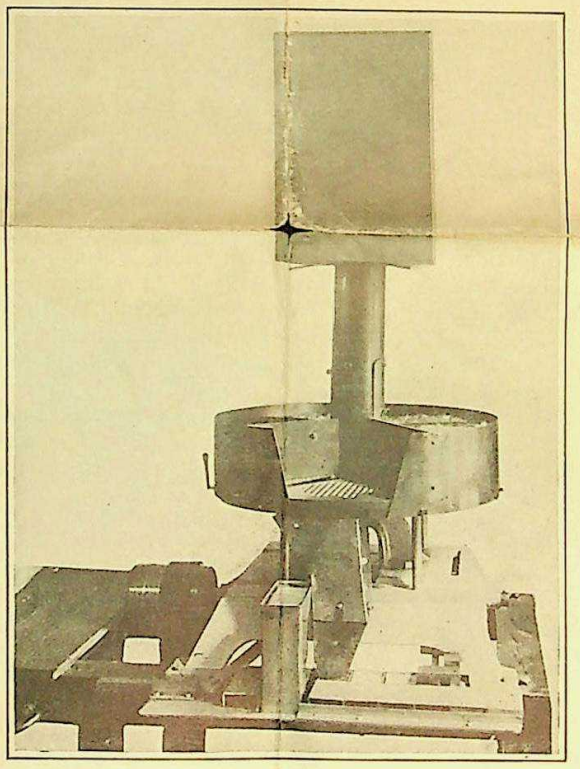
Gelatin is a very sensitive substance. It is delivered in thin slabs, three inches by eight, like glue. It really is a very refined glue, made from selected stock and manufactured with great care. If overheated it deteriorates to such an extent as to unfit it for medicinal purposes, and it will fail to dry properly, in capsule form, unless certain conditions of temperature and humidity are preserved. Furthermore, capsules must be absolutely clear and practically sterile when distributed to the druggist trade, which means that in all the processes of manufacture the gelatin must not come in contact with human hands.

The largest capsule factory in the world is that owned and operated by a firm of pharmaceutical chemists in Indianapolis, Ind. The output for each working day amounts to something like 2,500,000 capsules. This refers to empty capsules only.

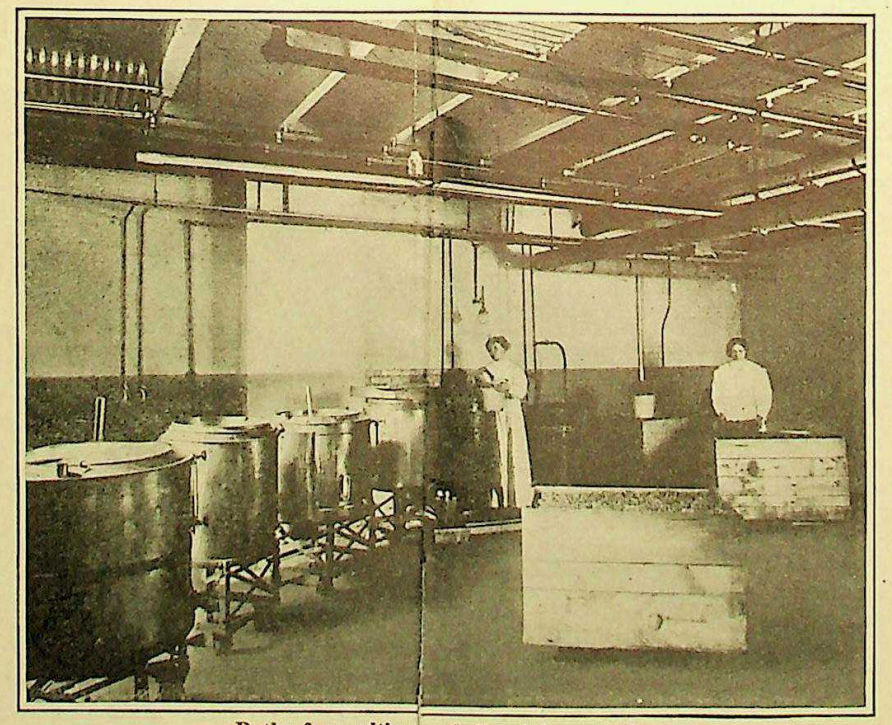
Each parcel of gelatin received is subjected to rigid tests to insure its quality and absolute purity before it is admitted to the stock room. As required it is drawn from stock and soaked in cold water for three or four hours. The water is then drawn off and the softened gelatin placed in hot-water-jacketed tanks, to be melted. It is under constant supervision and the degree of heat must be regulated to a nicety. From the melting room the tanks are sent to the manufacturing department and the melted gelatin is distributed to the machines as needed.

These are ingenious and intricate affairs, some parts of which move very slowly, and independently, while others must move synchronously and with rapidity. They are electrically driven and are made solely for these manufacturers, who own all the patents. The pins of non-corrosive phosphor-bronze on which the capsules are molded are set in bars, thirty pins to the bar, and pass through the machine in pairs, cap and body forms side by side. The bars are carried on endless chains, with the pins upright until they are immediately over the gelatin tank. At this point they stop and the pins are turned down, while a small tank of melted gelatin rises and coats them. They then turn over twice to distribute the gelatin evenly, move ahead a few inches, turn over once more with a reverse motion and then pass into the curing chamber, from which they emerge in about an hour.

The gelatin tanks in the machines are kept supplied by an attendant and an even temperature is maintained by means of gas burners regulated by thermostats.



Close view of the counting and boxing machine



Baths for melting and dissolving gelatin

With the exception of one link which is purposely omitted to insure the constant watchfulness of the operator, the machines are entirely automatic.

When the bars issue from the curing chamber the gelatin coating on the pins is trimmed, stripped and the two halves forced together. The finished capsule is then blown into a receptacle by compressed air.

The product of each machine is being frequently tested with delicate callipers to insure uniform thickness in the capsule walls. Should any machine develop a tendency to make the gelatin coating a fraction too thick or thin, it is stopped until the trouble is remedied.

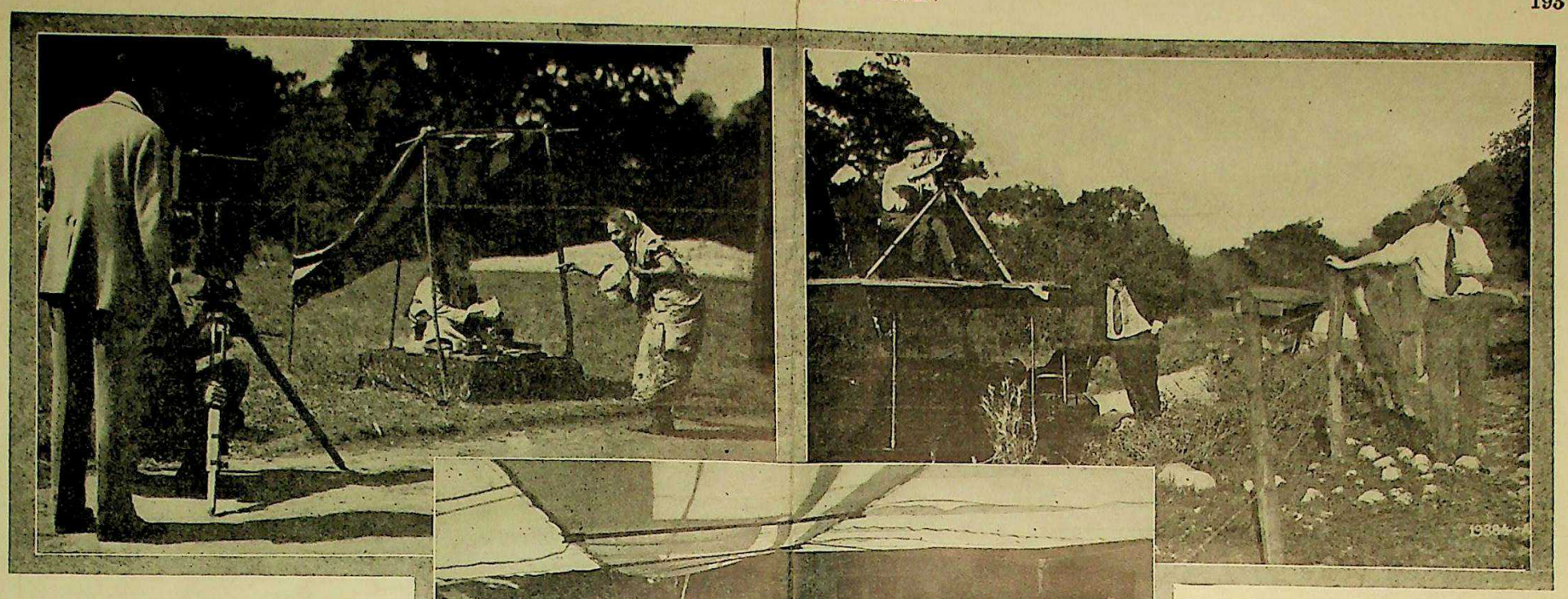
From the capsule machines the stock moves to sorting machines where all scraps or defective capsules are removed and the perfect stock is deposited in light, portable bins, capable of holding several bushels each. The stock then proceeds to the counting machines, where the operator feeds partially opened slide boxes into a hopper. Exactly 100 capsules are deposited in each box, the lid is closed, and the box is passed on a belt carrier to a girl who deftly wraps a dozen boxes in a neat package and pastes on the label.

Many sizes of capsules are produced in this factory, from the tiny little ones to huge horse capsules which measure ⅞-inch in diameter by 2½ inches long, of an ounce capacity. To meet the requirements of physicians who sometimes desire to conceal the nature of powders, or where alternate doses of different drugs are to be administered, a few capsules are colored brown, green, pink and frosted white.

The manufacturing room contains a battery of 50 machines, each with a capacity of about 50,000 capsules in eight hours. Each machine carries from 175 to 200 pairs of bars. The operators are all girls, and the visitor is impressed with their healthful appearance and fine complexions, due probably to the extremely sanitary conditions which of necessity obtain throughout the plant.

Chasers to Give Place to Destroyers

FOLLOWING the recommendations of the General Board of the Navy, the Navy Department has decided to place no more contracts for submarine chasers, but to build destroyers instead. This does not mean that the chasers are a failure; far from it. For they are excellent boats on patrol in the more sheltered waters in which the smaller German submarines are operating. The change from the construction of chasers to that of destroyers is designed to meet the developments of U-boat warfare, which have been in the direction of larger boats of wide radius of action, capable of operating far out in the Atlantic. To patrol properly the lanes of steamship travel for a distance of 300 miles or more from the French and British coasts calls for a boat of the size and seakeeping qualities of the destroyer. If the Department were wise, it would sacrifice every other form of new constructive work in favor of a big destroyer program calling for at least 250 of these craft.



Odd moments with the camera-man who records our dramas and our comedies

At the left: An Artcraft camera-man peering through the peep-hole of his camera in order to focus filmdom's leading star on his film. *At the right:* Making a picture in the field for a Pallas production. Here the camera-man is perched on top of the 'bus which serves to carry the players to distant spots or "locations". *Below:* A typical outdoor studio scene in southern California, where the sunlight is used for both interior and exterior pictures. Note the sunlight diffusers in this Pallas studio, which serve to eliminate shadows and reduce the intense light.

exposure. It is nothing more than a high-speed snap-shot camera which makes a large number of photographs every second.

Of necessity the camera contains many refinements. For instance, the film is contained in light-proof retorts or magazines, so that it can be loaded into and taken out of the camera in broad daylight. When placed in the camera the film is threaded through the mechanism and down to a second magazine, or "take-up" magazine, which gathers in the film as rapidly as it is exposed. In focusing the image two methods are available: First, by looking through a peep-hole at the image on either the film stock itself or on a piece of ground glass inserted in the light aperture; second, by a "guess-focus" scale on the lens barrel, much after the manner of the ordinary hand camera. The amount of film exposed is indicated on a dial, so that the camera-man always knows how much film he has left. A punch, incorporated in the construction, serves to put a hole in the film after each scene, so that the laboratory hands may know where each scene begins and ends and in this manner be able to cut the scenes apart and develop each strip separately. Lastly, two movements are provided, one for photographing at the standard rate of speed, and a second for photographing one picture at a time for trick effects.

The lens of the professional motion-picture camera is many times faster than that of the average still-picture camera. Indeed, it will make perfect pictures in the shade, and even in rainy weather it will turn out fair pictures, although these are obviously not as clear as those produced under favorable conditions. Nevertheless, the high-speed lens permits of making pictures in what the amateur photographer would call "impossible" places.

Accompanying the camera is a heavy tripod, which serves to hold it as steady as a rock while the film is being exposed. In view of the fact that the camera is making a series of snap-shots of 1/25th to 1/35th second exposure, it seems rather strange that a tripod should be necessary. But the explanation is simple: In order that the pictures may appear perfectly steady on the screen it is necessary that the camera make each picture of a series from precisely the same position. Furthermore, so great is the degree of magnification of the pictures on the screen that a slight "play" in the tripod mounting results in an inch or more of "play" when the picture is projected. Indeed, the camera-man, like the careful machinist, is dealing with hundredths and even thousandths of an inch, and the screen checks up his work in a greatly magnified form.

The tripod is provided with a geared head which, by means of two handles, may be tilted at any angle and turned around on a horizontal plane. Not only does this tilting and panoramic movement permit the camera-man to follow a moving object, but it also enables him readily to point his lens at any given object, aiming the camera all the while by means of direct-view finder.

The Camera-man as an Artist

If ever there was a genius it is the camera-man, for, starting out with the camera just as it was turned over to him by the motion-picture engineers, he has forever been busy improving its mechanism here and there, and developing any number of accessories which have gone far to make films more attractive to the eye. The fact is that the average camera-man is an artist; but instead of pigments and brushes he relies on various mechanical contraptions designed and constructed during odd moments.

One of the first effects introduced in films was the "fade-in" and "fade-out," in which the film, perfectly black at first, gradually becomes lighter and develops into a perfect picture on the screen, and the reverse operation. This is accomplished merely by closing or opening the iris diaphragm of the lens. Some cameras are equipped with automatic devices which can be arranged to "fade-in" or "fade-out" a picture in 5, 10 or 20 [illegible]. The camera-man merely sets the [illegible] and turns the crank without further attention.

Now the "fade-in" and "fade-out" effect has a most important application in joining two scenes, so that one literally flows into the other. This result is achieved by first "fading-out" one scene, noting the footage allowed for the operation. Next the film is turned back to a point where the "fade-out" began, and a "fade-in" of the new scene is made.

Numerous devices have followed the "fade-in" and "fade-out," since the camera-man discovered that there were other possibilities in film photography aside from the regular run of work. Film producers are ever ready to try out new effects, which, when they once appear on the screen, are immediately copied by competing producers whose camera-men after viewing the novel effects deduce the method probably used—or substitute their own.

A later-day effect is the "circle vignette," by which is meant the fading out of the corners and edges of a picture on the screen. While there are several ways of obtaining this result, the most popular appears to be the use of an iris diaphragm in front of the lens, which permits a circle of any size. As a variation of the "fade-in" and "fade-out," the circle vignette can be used to "circle-in" a picture and "circle-it" out again. Thus a picture on the screen suddenly opens up from blackness to a circle of ever-increasing size, until the rectangular outline is reached. The "circle-out" effect is just the reverse of this. It is possible to obtain either hard edges or comparatively soft edges on

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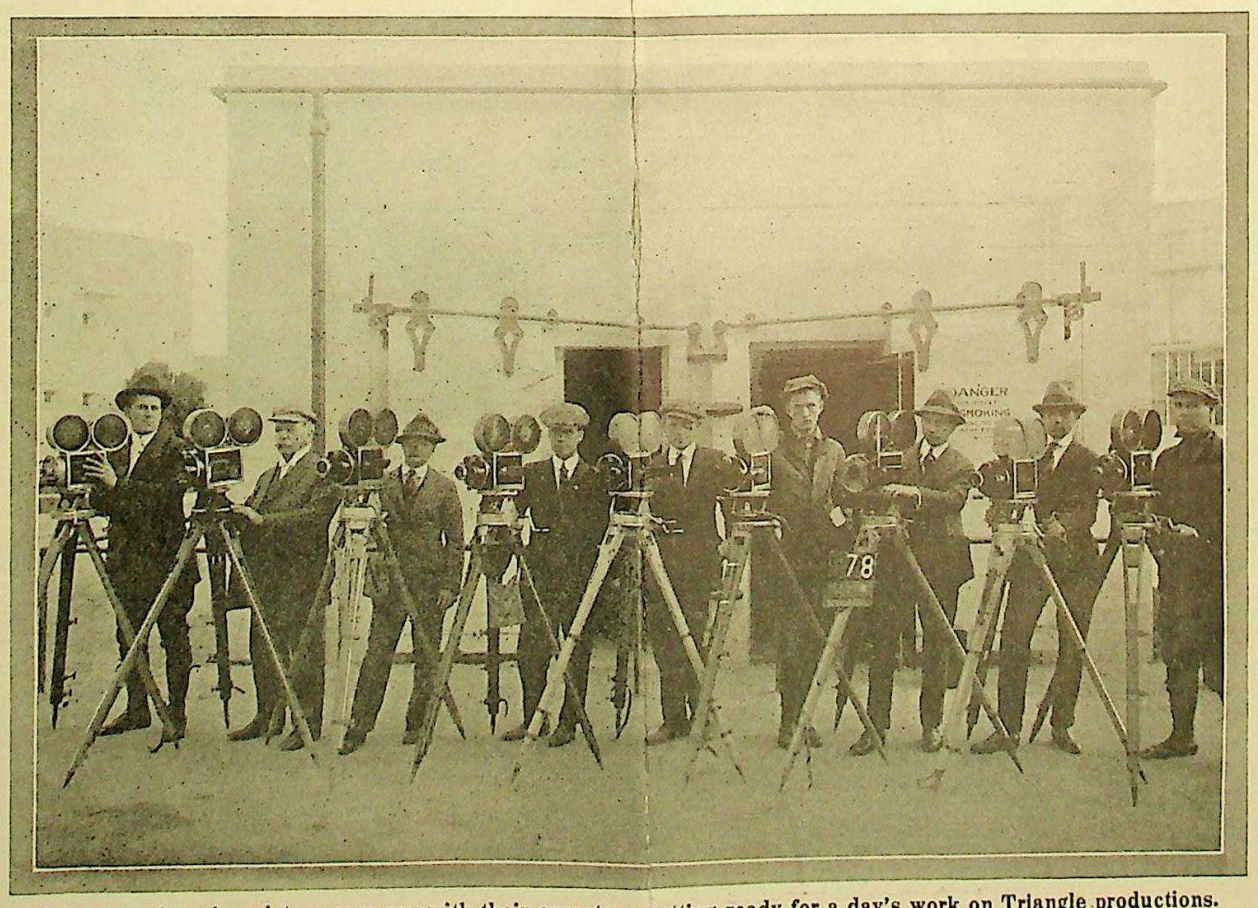

A battery of motion-picture cameras with their operators, getting ready for a day's work on Triangle productions. The structure back of them is a fire-proof film vault